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ELECTROMECHANICAL ASSESSMENT OF MYOCARDIAL FUNCTION (NOGA) IS ASSOCIATED WITH EXERCISE IMPROVEMENT IN PATIENTS TREATED WITH AUTOLOGOUS STEM CELL THERAPY FOR REFRACTORY ANGINA

Poster Contributions
Poster Sessions, Expo North
Sunday, March 10, 2013, 3:45 p.m.-4:30 p.m.

Session Title: Cell Therapy and Angiogenesis
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Authors: *Ki Park, Tianyao Huo, Yueh-Yun Chi, Eileen Handberg, Adel Nada, Candice Junge, Douglas Losordo, Carl Pepine, R. Anderson, University of Florida College of Medicine, Gainesville, FL, USA*

Background: Endomyocardial mapping (NOGA®) allows "on-line" assessment of electrical (voltage) and mechanical (linear local shortening) parameters within the left ventricle. Although used to direct injection of stem cells for angina and/or heart failure, the utility of NOGA parameters to predict outcomes has not been previously studied. We hypothesized an association between NOGA parameters and exercise outcomes in patients with refractory angina enrolled in the ACT34-CMI cell therapy trial.

Method: We evaluated 69 patients with refractory angina and NOGA data available prior to autologous, intramyocardial CD34+ cell treatment or placebo. Patients underwent 8-10 injections within ischemic, viable myocardium (defined by SPECT) with injection site unipolar voltage (UpV) and linear local shortening (LLS) recorded. At 6 and 12 months, changes in weekly angina frequency and treadmill exercise time were examined according to baseline NOGA data and treatment assignment.

Results: LLS values did not correlate with either exercise or angina outcomes. Comorbidities of diabetes and heart failure were significantly associated with change in exercise duration at 12 months (p-values 0.0135 and 0.0005). Average injection UpV at baseline was also associated with improvement in exercise duration at 12 months (85 ± 188 seconds, p=0.01). Regression modeling revealed an interaction between low dose cell therapy treatment, heart failure variables and 12 month exercise outcome (p-value 0.0495 and 0.0484). For modeling limited to NOGA parameters, average injection UpV was significantly associated with exercise change at 12 months (P = 0.0237). When restricted to patients who were injected per protocol (injections with voltage >7mV and 10 injections delivered) (n=29), the association between UpV and exercise outcomes remained significant at 12 months (90 ± 137 seconds, p=0.016).

Conclusion: In this analysis, average injection site UpV for intramyocardial delivery of CD34+ cells was associated with an improvement in exercise duration following therapy for refractory angina. Electromechanical ventricular assessment, specifically UpV, may predict improvement in exercise after angiogenic therapy.